

Evidence Bibliography: Clinical Pharmacy Practice in Mental Health

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The following collection of articles contributes to the growing literature of pharmacist impact on patient care. We have included interventions in mental health disease states or settings, ranging from chart reviews and adherence counseling to collaborative practice agreements that allow pharmacists to prescribe and manage medications. There are also several position papers written by leaders in the field promoting the value of pharmacists in a variety of settings, many of which include a comprehensive review of the studies presented in this document. Citations noted with an asterisk (*) have been authored by Veterans Affairs (VA) or other federally-employed pharmacists. To jump to specific sections of interest, please select from one of the following:

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Systematic Reviews

1. Al-jumah KA, Qureshi NA. **Impact of pharmacist interventions on patients' adherence to antidepressants and patient-reported outcomes: a systematic review.** Patient Prefer Adherence. 2012;6:87-100.
 - **Design:** A systematic review of the literature was conducted during August–November 2010 using PubMed, BIOSIS Previews® Web of Science, ScienceDirect, the Cochrane Library, PsycINFO®, IngentaConnect™, Cambridge Journals Online, and Medscape databases. Key text words and medical subject headings included pharmacist intervention, medication intervention, depression, medication adherence, health-related quality of life, patient-reported outcomes, and antidepressants.
 - **Outcomes:** A total of 119 peer-reviewed papers were retrieved; 94 were excluded on the basis of abstract review and 13 after full-text analysis, resulting in twelve studies suitable for inclusion and intensive review. The most common intervention strategy that pharmacists utilized was a combination of patient education and drug monitoring. Cumulative patient adherence improvement in this review ranged from 15% to 27% and was attributed to utilization of different interventions and different combinations of interventions together with patient satisfaction with the treatment when depression improved.
 - **Conclusion:** This review suggests that pharmacist intervention is effective in the improvement of patient adherence to antidepressants. This may be a basis for more studies examining the effectiveness of innovative interventions by pharmacists to enhance patient adherence to antidepressant medications.



2. Rubio-Valera M, Chen TF, O'Reilly CL. **New roles for pharmacists in community mental health care: a narrative review.** Int J Environ Res Public Health. 2014;11(10):10967-90.
 - **Design:** Narrative review of the literature for pharmacist interventions in mental health care
 - **Section 1:** Role of mental health pharmacists on interdisciplinary teams and early detection of mental illness. This section describes the many existing practices for pharmacists and their roles in medication management and offers suggestions for potential inclusion in other settings. Some examples that have been published (and are available within this document) include benzodiazepine de-prescribing in prison populations, improving access to substance use disorder care in a community health setting (Wong et al, 2011), and improving rates of prescribing medications for alcohol use disorder (Dimitropoulos et al, 2018).
 - **Section 2:** Describes pharmacists' role in supporting quality use of medications by targeting medication reviews, adherence, and polypharmacy, especially considering medications are the primary modality of treatment for mental illnesses such as bipolar disorder, schizophrenia, and depression. There is a focus on medication reviews in nursing homes and residential care facilities as polypharmacy tends to be highly prevalent in these populations. Educational interventions to improve adherence and reducing antipsychotic polypharmacy is also addressed.
 - **Section 3:** Barriers and facilitators to the implementation of mental health pharmacy services with a focus on organizational culture and mental health stigma. In community pharmacies, the dichotomy of business vs professional roles may hinder efforts to reduce polypharmacy or suggest non-pharmacologic treatments. This section includes several studies showing how stigma can interfere with medical care received by those with mental illness in addition to strategies to reduce stigma during pharmacy training.
3. Richardson TE, O'Reilly CL, Chen TF. **A comprehensive review of the impact of clinical pharmacy services on patient outcomes in mental health.** Int J Clin Pharm. 2014;36(2):222-32.
 - **Design:** Studies included needed to demonstrate a process or program conducted by pharmacists in a hospital setting, which directly involved mental health patients or mental healthcare providers.
 - **Outcomes:**
 - Outcomes as a result of clinical pharmacists were measured in 11 out of the 18 studies reviewed. Clinical outcomes were reported in 7 studies, economic outcomes in 2 studies, and 1 study reporting humanistic outcomes. One study reported both clinical and economical outcomes being achieved as a result of a clinical pharmacist service.
 - The remaining 7 studies focused on the direct impact of the clinical pharmacist service such as the implementation rate of recommendations.
 - **Conclusion:** This review suggests that clinical pharmacists play a wide variety of roles in the provision of inpatient mental healthcare.
4. *Basit SA, Mathews N, Kunik ME. **Telemedicine interventions for medication adherence in mental illness: A systematic review.** Gen Hosp Psychiatry. 2019;62:28-36.
 - **Design:** This comprehensive review looked at randomized controlled trials involving telemedicine interventions for patients with depression, bipolar disorder, or schizophrenia, including outcome data of medication adherence
 - **Outcomes:**
 - 17 articles were uncovered, with 11 high-intensity interventions

- Most commonly, telemedicine interventions were completed via telephone
- Efficacy for adherence was demonstrated in 9 studies
- **Conclusions:** Telemedicine interventions can positively impact patient adherence for those with mental illness.

Healthcare Landscape/Care Management

1. Giberson S, Yoder S, Lee M. **Improving patient and health system outcomes through advanced pharmacy practice. A report to the U.S. Surgeon General. Office of the chief pharmacist. U.S. Public Health Service.** Commissioned Corps of the U.S. Public Health Service. Available at: https://dcp.psc.gov/osg/pharmacy/sc_comms_sg_report.aspx. Accessed March 25, 2016.
 - **Summary:** A 2011 report by the Surgeon General discussed the expanding role of pharmacists in improving health care delivery. The report discussed the challenges of healthcare access, workforce shortages, safety, quality, and cost. The report focused on four main discussion points:
 - First, pharmacists' services after a patient's initial diagnosis include performing patient assessments, having prescriptive authority to manage chronic diseases, ordering/interpreting/monitoring labs, and developing relationships with patients for follow up care.
 - Second, pharmacists should be recognized as health care providers as currently the Social Security Act or Centers for Medicare and Medicaid Services do not recognize pharmacists as providers.
 - Third, the Surgeon General expressed concerns for sustaining clinical pharmacist services.
 - Finally, the Surgeon General's report reviewed 298 research studies that found pharmacists improved patient outcomes, increased access to care, enhanced cost-effectiveness, and assured patient safety.
2. Wheeler A, Crump K, Lee M, et al. **Collaborative prescribing: a qualitative exploration of a role for pharmacists in mental health.** Res Social Adm Pharm. 2012;8(3):179-92
 - **Design:** Focus group interviews were conducted to identify themes of health professional and consumer attitudes and beliefs relating to clinical pharmacy specialists in mental health with advanced scopes of practice.
 - **Outcomes:**
 - Widespread acknowledgment of the role of clinical pharmacy specialists as collaborative prescribers in mental health and as integral members of the multidisciplinary team
 - Consumers were unaware of pharmacists' role in secondary care
 - Concerns regarding demonstrating competence, practitioner role/boundary confusion, insufficient training and workforce development, hesitancy by pharmacists to extend role, consumer awareness, and public perception of the traditional pharmacist role were identified.
 - Solutions discussed included education by the profession; relationship building, training, and robust competency assessments; and a structured framework for implementing a collaborative prescribing model.
 - **Conclusion:** This study suggests there was recognition and acceptance of the role that clinical pharmacy specialists could play in contributing to the care of mental health consumers as collaborative prescribers; their medication expertise being highly regarded.

3. McInnis T, Strand LM, Webb CE. **The Patient Centered Medical Home: Integrating Comprehensive Medication Management to Optimize Patient Outcomes.** 2nd ed. Washington, DC: Patient Centered Primary Care Collaborative, 2012.
 - **Summary:** The Patient-Centered Primary Care Collaborative published a resource guide in 2012 entitled "Integrating Comprehensive Medication Management to Optimize Patient Outcomes." This guide outlines how pharmacists promote the safe, appropriate, and effective use of medications with a demonstrated return on investment by providing effective medication management.
4. Bodenheimer TS, Smith MD. **Primary care: proposed solutions to the physician shortage without training more physicians.** Health Aff (Millwood). 2013;32(11):1881-1886.
 - **Summary:** The article discusses how non-physicians can help address the increasing shortage of primary care physicians in the United States. As demand for primary care services is projected to increase, the supply of primary care physicians is continuing to decline. Authors propose that non-physician professionals such as pharmacists and nurses are essential in saving time for physicians, providing quality care to patients, and improving patient satisfaction. Non-physician healthcare professionals have the capability to offer preventative care, acute care, and chronic care for a variety of conditions and diseases. As an example, pharmacists may act as a coach and regularly follow-up with patients that have chronic conditions like diabetes.
 - **Conclusion:** Overall, it is predicted that 24% of physician time can be saved by delegating tasks to other non-physician professionals. Other methods of addressing the shortage of primary care physicians include improved technology and increased patient involvement in self-care.
5. McKee JR, Lee KC, Cobb CD. **Psychiatric pharmacist integration into the medical home.** Prim Care Companion CNS Disord 2013;15(4).
 - **Summary:** Authors discussed the benefits of integrating psychiatric pharmacists into the patient-centered medical home (PCMH). To address a lack of coordination between behavioral health and primary care providers, the clinical services of psychiatric pharmacists may particularly help reduce costs within a PCMH. Patients with mental illness have higher rates of hospitalizations than those without mental illness, and they are at risk for stigmatization from other members within the population. When integrated into the healthcare team, psychiatric pharmacists may promote appropriate medication use, safety, effectiveness, and adherence through comprehensive medication management (CMM). Psychiatric pharmacists can help reduce costs, considering that CMM services conducted by pharmacists result in an average return on investment of 3:1 to 5:1. The College of Psychiatric and Neurologic Pharmacists (CPNP) advocates for more role-recognition and reimbursement for clinical pharmacists.
6. Smith MD, Bates DW, Bodenheimer TS. **Pharmacists belong in accountable care organizations and integrated care teams.** Health Aff (Millwood). 2013;32(11):1963-70. doi: 10.1377/hlthaff.2013.0542.
 - **Summary:** Discussed the importance of developing a team-based approach for healthcare. Medical homes, accountable care organizations, and community-based care teams should have pharmacists included on their multidisciplinary teams. Pharmacists participating at the full level of their licenses can help solve complex medical problems and offer CMM services. Multiple studies showed the involvement of pharmacists improved patient outcomes. Some challenges that

prevent the widespread adoption of pharmacists into healthcare teams are company policies and lack of recognition of pharmacists as reimbursable providers.

7. Patel MS, Arron MJ, Sinsky TA, et al. **Estimating the staffing infrastructure for a patient-centered medical home.** Am J Manag Care 2013;19(6):509-516.
 - **Design:** Authors interviewed nine administrators of patient-centered medical homes (PCHMs) who either published approaches of their practice model in a peer-reviewed journal or presented their results at an academic meeting. Interviews were conducted by telephone.
 - **Conclusion:** As a result, authors estimated that 4.25 full-time equivalents (FTEs) of personnel should be required for every physician FTE, including 0.2 FTE pharmacist time. Compared to the base-case, 4.25 FTEs would result in a 59% increase of staffing personnel within a physician's panel. More reimbursement would be necessary to support an increase in staff members, since \$4.68 per member per month is the estimated incremental cost for additional staffing compensation. In a PCMH, improved healthcare outcomes have potential to outweigh additional staffing compensation. The study was limited because of a wide variation in staffing ratios and compensation between different practices in the sample.
8. Valkova S, Gorokhovich M, Sacks N. **Avoidable costs in U.S. healthcare (06/2013).** IMS Institute for Healthcare Informatics Web site.
 - **Summary:** The IMS Institute for Healthcare Informatics released a report to describe the national impact of unnecessary healthcare expenditures, and authors proposed ways of reducing avoidable healthcare costs. The report stated that \$213 billion of avoidable medication-related costs pertain to six different categories: nonadherence to medication, delayed care, antibiotic misuse, medication errors, inadequate use of generic drugs, and polypharmacy in the elderly. Nonadherence accounts for the largest portion of avoidable costs related to medication, and most of these expenses are spent towards hospital admissions. To support savings in healthcare costs, the report included case-by-case examples of how organizations conducted interventions to reduce healthcare costs. Authors also identified which type of stakeholders would benefit from various types of interventions. The report concluded that a team-based approach is required to significantly reduce unnecessary healthcare costs.
9. Nigro SC, Garwood CL, Berlie H, et al. **Clinical pharmacists as key members of the patient-centered medical home: an opinion statement of the Ambulatory Care Practice and Research Network of the American College of Clinical Pharmacy.** Pharmacotherapy 2014;34(1):96-108.
 - **Summary:** The ACCP Ambulatory Care Practice Research Network (PRN) wrote an opinion statement about the integration of pharmacists into the PCMH. In the article, authors encouraged pharmacists to assume clinical, team-based roles within the PCMH. Research shows that pharmacists can improve patient care outcomes in a quality and cost-effective manner. However, ongoing development of best practice models is needed to help promote recognition of pharmacist value by third-party payers. The article reviews key primary literature related to the impact of a clinical pharmacist in team-based care. The article additionally described many examples of innovative practice models used by other ACCP members. Authors also conducted a survey, in which 330 ACCP members were asked about involvement within their practice site.
 - **Outcomes:** Most pharmacists frequently participated in medication reconciliation and comprehensive medication management but had limited involvement with immunizations and implementing quality improvement projects.

10. Lunner K, Smith MD, Peña C. **Optimized medication use: A growing priority for ACOs (03/2014).** Leavitt Partners Web site.

- **Summary:** In this article, the Leavitt Partners Center provides a review of the challenges and solutions of optimizing medication use in an accountable care organization (ACO). Medication-related issues pertain to 58% of quality metrics established by the CMS, and commercial ACOs often incorporate medication use issues into their quality measurements. Pharmacists help improve direct patient care through medication reconciliation, comprehensive medication reviews, medication adherence promotion, and chronic disease management. Some challenges of improving medication use include lack of payment for pharmacists, competing priorities for the ACO, limited data about reduced future costs from pharmacists, and lack of understanding about the role of clinical pharmacists. Pharmacists are in a unique position to improve quality of care and reduce costs associated with ACOs by addressing challenges associated with optimal medication use.

11. Members of the PCPCC Medication Management Task Force. **Integrating comprehensive medication management to optimize patient outcomes (06/2014).** Patient-Centered Primary Care Collaborative Web site. Available at:
<https://www.pcpcc.org/sites/default/files/media/medmanagement.pdf>. Accessed April 4, 2016.

- **Summary:** Pharmacists and physicians within the PCPCC task force wrote this article to describe the role of comprehensive medication management (CMM) in primary care. CMM promotes better health outcomes by assuring appropriate, safe, effective, and adherent use of medications. The CMM should consist of an assessment of a patient's medication needs, identification of drug-related problems, care plan development with personalized goals, and patient follow-up with objective quality measures. Authors described how to implement pharmacist referrals for CMM into practice. Physicians often refer patients to another pharmacist within their own practice, since primary care sites often employ full-time and part-time clinical pharmacists. In other practices, physicians may refer a patient to a pharmacist practitioner in the community setting. The article provides CPT codes that can be used for CMM conducted by pharmacists and also describes when it is appropriate to use certain billing codes. In addition, the article mentions other payers for pharmacist services such as Medicare Part D, some state programs, and private sector payers.

12. Morrison C, Glover D, Gilchrist S, et al. **A Program guide for public health partnering with pharmacists in the prevention and control of chronic diseases. National center for chronic disease prevention and health promotion.** CDC Web site. Available at:
https://www.cdc.gov/dhdsdp/programs/spha/docs/pharmacist_guide.pdf. Accessed March 25, 2016.

- **Summary:** The CDC paper summarized the current role of the pharmacist; defined MTM, CMM, and collaborative drug therapy management; provided an overview of pharmacists' scope of practice; and offered evidence to support the role of pharmacists in team-based health care. The paper referenced the Asheville Project that showed that 69% of patients achieved their cholesterol goal and 81% of patients achieved their hypertension goals after meeting with a pharmacist.

13. Goldstone LW, DiPaula BA, Caballero J, Park SH, Price C, Slater MZ. **Improving medication-related outcomes for patients with psychiatric and neurologic disorders: value of psychiatric pharmacists as part of the health care team.** Ment Health Clin. 2015;5(1):1-28. DOI: 10.9740/mhc.2015.01.001.

- **Summary:** The purpose of this paper is to discuss the impact of psychiatric pharmacists and the ways in which they, as part of a collaborative team, can improve medication related outcomes for patients with psychiatric or neurologic disorders. The paper's authors describe the expertise and skills of psychiatric pharmacists and the associated positive outcomes for patients with these disorders. Psychiatric pharmacists have specialized knowledge, skills, and training or substantial experience working with patients with psychiatric or neurologic disorders. As part of the collaborative team with a physician, psychiatric pharmacists can provide comprehensive medication management (CMM), a direct patient care service, to patients with psychiatric or neurologic disorders. CMM is a standard of care in which all medications for an individual patient are assessed to determine appropriateness, effectiveness, safety, and adherence. Studies have shown that when psychiatric pharmacists are included as part of the collaborative team with a physician, medication-related outcomes for patients with psychiatric or neurologic disorders improve.

14. Isasi F, Krofah E. **The expanding role of pharmacists in a transformed health care system (1/13/2015).** National Governors Association Center for Best Practices Web site. Available at: <https://www.nga.org/wp-content/uploads/2020/08/1501TheExpandingRoleOfPharmacists.pdf>. Accessed March 25, 2016.

- **Summary:** The National Governors Association summarized the current role of pharmacists and the future direction of pharmacy. Pharmacists under collaborative practice agreements are in a unique position to offer more direct patient care focusing on chronic diseases. Forty-eight states allow pharmacists to collaboratively work with providers. However, state and administrative barriers limit pharmacists' roles in direct patient care. Four states, California, North Carolina, Montana, and New Mexico, have the designation of advanced pharmacy practice (APP). Pharmacists under a collaborative practice agreement with the designation of APP have the ability to prescribe certain medications and be compensated for their services. Compensation for pharmacy services is not universal nor recognized by all insurance companies. Medicaid provides compensation for direct patient care in 15 states and MTM services in 9 states. Barriers that limit pharmacists from offering direct patient care are inconsistent reimbursements and not having access to patients' health record.

15. *Gören JL, Rose AJ, Smith EG, Ney JP. **The Business Case for Expanded Clozapine Utilization.** Psychiatr Serv. 2016;67(11):1197-1205.

- **Summary:** This business case analysis investigates the health care cost savings of increasing clozapine use in those with treatment-resistant schizophrenia. Analysis showed this VHA hospital would save \$22,444 per Veteran, primarily by way of 18.6 fewer inpatient days per patient.

16. National Council for Behavioral Health. **The Psychiatric Shortage: Causes and Solutions.** 2017 Mar 28.

- **Summary:** The report concluded that with the shortage of psychiatrists, training new psychiatrists and increasing the number of psychiatrists by itself, will not be sufficient to improve access and the quality of care. The expanded use of other providers, including Mental Health Clinical Pharmacy Specialists (MH CPS) that can prescribe psychiatric medications, is a necessary strategy in the face of the declining number of psychiatrists. Mental Health CPS are an emerging workforce that has special expertise in patients with complex medications regimens, such as those in community mental health. For complex patients, the MH CPS represents a key resource for managing multiple medications. Additional recommendations were related to training programs incorporating telepsychiatry, integrated behavioral health, team-based care, population health management, collaboration with other psychiatric prescribers, leadership, team building and management. These topics have been well integrated into PGY2 Psychiatric Pharmacy Residency Programs
- **Link:** [The Psychiatric Shortage: Causes and Solutions](#)

17. Kelly DL, Freudenreich O, Sayer MA, Love RC. **Addressing Barriers to Clozapine Underutilization: A National Effort.** Psychiatr Serv. 2018;69(2):224-227.

- **Summary:** This publication describes discussions of a workgroup created to address barriers to clozapine use. The open forum focused on 14 barriers previously established, including medical side effects, registry process, lack of centralized resources, and logistics of monitoring practices. Suggestions made to overcome these barriers include improving residency training, improving the process of clozapine REMS program especially within hospital and correctional facility formularies, and advanced point-of-care testing abilities.

18. Bozyski KM, Ansara ED, Ott CA, Titus-Lay EN, Williams KE. **The Future of Psychiatry Commission [correspondence].** Lancet Psychiatry. 2018;5:15.

- **Design:** This letter was in response to the World Psychiatric Association and Lancet Psychiatry Commission article on the specialty of psychiatry facing major changes and challenges. The article described interdisciplinary relationships in depth, though notably lacking was the inclusion of psychiatric pharmacists. The letter respectfully promoted the role and benefits of including psychiatric pharmacists on care teams, focusing on their ability to optimize medication therapy, provide direct patient care such as medication management, and educate families, health care team members, and students of these disciplines.
- **Evidence:** There are almost 1000 pharmacists with BCPP certification, which is estimated to rise to 2400 by 2025. A 2017 National Council for Behavioral Health report addresses the psychiatric shortage similarly, referencing how psychiatric pharmacists can collaborate in the provision of care to patients living with mental illness. This report recognized the impact pharmacists have on improving patient outcomes, referencing examples like clozapine management, long-acting injectable antipsychotics clinics, and adherence interventions in hospitals, residential care facilities, community pharmacies, and outpatient clinics. A total of 160 publications were mentioned in a 2014 review which demonstrated pharmacists' value in psychotropic medication management.
- **Conclusion:** Together, this evidence presented the importance of recognizing psychiatric pharmacists as essential clinicians on interdisciplinary psychiatric teams.



U.S. Department of Veterans Affairs

Veterans Health Administration

PBM Clinical Pharmacy Practice Office

1970-2010

1. Rosen CE, Copp WM, Holmes S. **Effectiveness of a specially trained pharmacist in a rural community mental health center.** Public Health Rep. 1978;93(5):464-7.
 - **Design:** Retrospective review of patients managed by a pharmacist in 8 rural clinics over 3 years
 - **Practice:** Follow up care/medication management via psychiatric-trained pharmacist with collaborative practice agreement to adjust medications as necessary
 - **Outcomes:**
 - Cost of services was found to be roughly ½ that of a psychiatrist
 - Follow up showed those managed by pharmacists were “functioning at a slightly healthier level” than the other patients
 - **Conclusion:** Pharmacists can effectively provide medication management services when psychiatrists are inaccessible or unavailable, or when funds for mental health professionals are limited.
2. Rosen CE, Holmes CE. **Pharmacists’ impact on chronic psychiatric outpatients in community mental health.** Am J Hosp Pharm 1978;35:704–8.
 - **Design:** Retrospective chart review of thirty outpatients with chronic psychiatric illness in eight community mental health clinics over a three-year period.
 - **Control group** (148 patients) was treated by other mental health professionals.
 - **Practices:** Pharmacist provided case management services such as drug monitoring and educational services, and was permitted to adjust or prescribe drugs under protocol.
 - **Outcomes:**
 - Patients reported greater improvement in overall health, with a trend toward greater patient satisfaction.
 - Cost of psychiatrist services was 2.5 times greater than pharmacist services.
3. *Bond CA, Salinger RJ. **Fluphenazine outpatient clinics: a pharmacist’s role.** J Clin Psychiatry 1979;40:501–3.
 - **Design:** Retrospective chart review with historic control (before-after design) of twenty-five patients with schizophrenia in a VA psychiatric outpatient clinic over a one-year period.
 - **Practices:** Pharmacists provided drug monitoring services for approved patients; drug adjustments required psychiatrist approval.
 - **Outcomes:**
 - Decrease in hospital readmissions (42 admissions 1 year before intervention vs 3 admissions 1 year after)
 - Decrease of 1332 days of hospitalization
 - Estimated \$230,000 savings in inpatient utilization over one year
 - Decrease in side effects reported (38 before intervention vs 4 after)
 - Average decline of 39% in fluphenazine dosage requirements
 - 42% decline in anticholinergic use
4. *Gray DR, Namikas EA, Sax MJ, et al. **Clinical pharmacists as allied health care providers to psychiatric patients.** Contemp Pharm Pract 1979;2:108–16.
 - **Design:** Retrospective chart review with historic control (before-after design) of nineteen psychiatric patients in a VA psychiatric outpatient clinic over a three-month period.

- **Practices:** Pharmacists provided drug monitoring and weekly drug groups; pharmacists permitted to adjust or prescribe drugs under protocol.
 - **Outcomes:**
 - Nonsignificant improvement in clinical outcomes
 - Significant decrease in adverse effects (61 before intervention vs 20 after)
 - Significant decrease in number of prescribed drugs (decrease of 1.32 drugs/patient/month)
 - Improvement in patient's drug knowledge (53% score before intervention vs 77% score after)
5. Finley PR, Rens HR, Pont JT, et al. **Impact of a collaborative pharmacy practice model on the treatment of depression in primary care.** Am J Health Syst Pharm 2002;59(16):1518-26.
- **Design:** Mental Health Clinical Pharmacy Specialists (CPS) were included in a multidisciplinary collaborative practice model, working at the juncture between primary care and Psychiatry. In this model, designated PCPs could refer patients with depression to a MH CPS immediately after initiation of an antidepressant. 91 patients received care from CPS while 129 patients received usual care from their PCPs.
 - **Practices:** Clinical pharmacy specialists provided medication maintenance (with limited prescribing authority), modified doses under protocol, and provided follow-up patient care services at a clinic.
 - **Outcomes:**
 - Higher medication adherence rates (mpr 0.81 vs 0.66; p=0.0005)
 - Greater medication switch rates (24% vs. 5%; p=0.0001)
 - Fewer PCP visits (39% vs 12%; p=0.029)
6. Finley PR, Rens HR, Pont JT, et al. **Impact of a collaborative care model on depression in a primary care setting: a randomized controlled trial.** Pharmacotherapy 2003;23(9):1175-85.
- **Design:** Patients in primary care found to have depression were randomized to receive either care from a MH CPS as part of a collaborative care model (n=75) or usual care through their PCP (n=50) over a six-month period.
 - **Practices:** Clinical pharmacists provided patient education, drug therapy management, and treatment follow-up.
 - **Outcomes:**
 - Higher medication adherence in collaborative care model (76% vs 48%; p=0.038.)
 - Significantly improved patient satisfaction in collaborative care model
7. Bell JS, Rosen A, Aslani P, Whitehead P, Chen TF. **Developing the role of pharmacists as members of community mental health teams: perspectives of pharmacists and mental health professionals.** Res Social Adm Pharm. 2007;3(4):392-409.
- **Design:** Description of the decision-making process when community pharmacists consult with primary care physicians regarding mental health medication regimens
 - **Practice:** Community pharmacists in this study conducted home visits and reviewed charts of 44 patients with at least one psychotropic medication prescribed before bringing their recommendations to their primary care provider to discuss.
 - **Conclusion:** Case conferences allowed pharmacists and physicians to share information and discuss treatment options, though responsibility to implement changes remained with the primary care physician.

1. Wang I, Dopheide JA, Gregerson P. **Role of a psychiatric pharmacist in a Los Angeles "Skid-Row" safety-net clinic.** J Urban Health. 2011 Aug; 88(4): 718–723.
 - **Design:** Retrospective review of records of 48 patients referred to the psychiatric pharmacist over 7 months. PHQ9, CGI-S and CGI-I analyzed.
 - **Practice:** The clinical pharmacist conducted 60-75-minute initial appointments with 30-45 minute follow up appointments and had one clinic day per week. Treatment plans were coordinated with the PCP.
 - **Outcomes:**
 - Two patients achieved remission of depression.
 - Mean change in PHQ9 was -5.7 ± 5.7 ($p=0.02$) at the end of the study period.
 - 77% showed improvement (CGI-I score of 1-3) and 11.5% of patients achieved CGI-I score of 1.
 - Two patients worsened and self-discontinued their medications.
 - PCPs accepted all recommendations made by the psychiatric pharmacist
2. Tallian KB, Hirsch JD, Kuo GM, et al. **Development of a pharmacist-psychiatrist collaborative medication therapy management clinic.** J Am Pharm Assoc 2012;52(6): e252-8.
 - **Design:** A pharmacist-run Medication Therapy Management clinic was established in collaboration with the Outpatient Psychiatric Services at the University of California San Diego. Analysis included number of patients co-managed, dropout rates, visit duration, and billed minutes over a 20-month period.
 - **Practices:** Two board certified psychiatric pharmacists provided direct patient care three days a week in a clinic setting using a collaborative practice protocol that included pharmacotherapy management, laboratory monitoring, medication counseling, and psychosocial referrals to other providers.
 - **Outcomes:**
 - The two pharmacists effectively co-managed 68 patients with major depressive disorder, schizophrenia, schizoaffective disorder and/or bipolar disorder.
 - 82.3% of patients were clinically stable and remained on the pharmacist caseload for the entire 20-month period.
 - Patients had an average of 7.7 visits (total of 491 visits), averaging 26 minutes per visit. Billing was done at \$4.82/minute which equaled \$84,542.80.
3. Nazarian PK, Dopheide JA. **Psychiatric Pharmacist Management of Depression in Patients with Diabetes.** Prim Care Companion CNS Disord. 2013; 15(5).
 - **Design:** Prospective evaluation of effect of psychiatric pharmacist interventions in 15 patients with depression and diabetes, as reflected by change in PHQ9.
 - **Practice:** Psychiatric medication management by a psychiatric pharmacist delivered over 30 to 60 minute appointments.
 - **Outcomes:** Mean change of -9.5 in PHQ9. Response achieved in 89% (9) patients not LTFU, and one-third (3) patients achieved remission.
4. Salloum NC, McCarthy MJ, Leckband SG, Kelsoe JR. **Towards the clinical implementation of pharmacogenetics in bipolar disorder.** BMC Med. 2014 May 30;12(1):90. PMID 24885933.
 - **Design:** Literature review of selected drug-genotype associations with the strongest evidence for utility in bipolar disorder pharmacotherapy management.

- **Summary:** A comprehensive list of genes have been identified for their ability to predict response to various medications, including lithium, antipsychotics, and antidepressants. This list also includes important genes for determining sensitivity to serious side effects, such as Stevens-Johnson syndrome (SJS). This article compiles all relevant genes and provides clinical recommendations for the appropriate implementation of pharmacogenomic testing in practice.
5. Cobb C. **Optimizing medication use with a pharmacist-provided comprehensive medication management service for patients with psychiatric disorders.** *Pharmacotherapy* 2014;34(12):1336-1340.
 - **Design:** Retrospective review and analysis of medication-related data and a return on investment cost analysis. 154 patients with psychiatric disorders were referred to a pharmacist for comprehensive medication management.
 - **Practice:** Medications were reviewed by pharmacists and recommendations were mailed to patient and physician within 1 week. Patients could follow up as many times as required to resolve medication issues.
 - **Outcomes:**
 - 256 CMM visits completed
 - 5.6 drug therapy problems per patient identified
 - Total net cost savings estimated at \$90,484.00 with mean savings of \$586.55 per patient
 - Cost of providing service estimated at \$32,185.93. Return on investment was \$2.80 for every dollar spent providing the service.
 6. Goldstone L, Saldana S, Werremeyer A. **Pharmacist provision of patient medication education groups.** *Am J Health-Syst Pharm* 2015;72:487-92.
 - **Summary:** Goldstone and colleagues addressed the problem of patients' adherence to psychiatric medications due to lack of medication education by providing an in-depth overview of medication education groups. They noted that few patients received proper counseling for the medications they were prescribed. Pharmacists counseled approximately 22% of patients in the hospital who were at high risk and 43% of patients in the community setting. In order to reach more patients and maximize time, pharmacists can use patient medication education groups (PMEG) to offer their services more efficiently. Some of the barriers that may limit the implementation of PMEGs include the following: lack of pharmacists that are properly trained, staffing issues, and lack of funding.
 7. Deslandes RE, John DN, Deslandes PN. **An exploratory study of the patient experience of pharmacist supplementary prescribing in a secondary care mental health setting.** *Pharm Pract (Granada)*. 2015;13(2):553.
 - **Design:** Semi-structured interviews of 11 patients on their experiences with a pharmacist supplementary prescriber in a mental health outpatient setting.
 - **Outcomes:** Patients reported valuing the increased access and continuity of their prescriber (the pharmacist) compared to other healthcare professionals. They trusted the pharmacist and their knowledge of the medications and felt they had an active role in decisions concerning their healthcare.
 - **Conclusion:** Patients have positive views of pharmacist prescribers and wide-spread implementation of this model should include research on a larger scale to evaluate its impact.

8. *Salvig B, Easterling J, Mosely M, Patel E, Joppich H, Bean J. **Improving Antipsychotic Use in a VA Community Living Center.** Annals of Long-Term Care. 2015;23(3):35-39.
- **Design:** Quality improvement study assessing antipsychotic use in a Veterans Affairs long-term care Community Living Center (CLC), documentation of as-needed antipsychotic use, and trend evaluation of antipsychotic use over a two-year period (2011 – 2013).
 - **Practices:** CLC transitioned from paper documenting to an electronic system; education on effective use of nonpharmacologic interventions was provided to staff by members of interdisciplinary team.
 - **Outcomes:**
 - Reduction of CLC residents with a written prescription for as an-needed antipsychotic (76 -> 33; p=0.006)
 - Reduction of CLC residents receiving an as-needed antipsychotic dose (45 -> 13; p=0.008)

2016-Present

1. *Leach M, Garcia G, Ganzer N. **Implementation and evaluation of a pharmacist-run mental health treatment clinic via clinical video telehealth.** Ment Health Clin. 2016;6(3):159-164.
- **Design:** Prospective chart review of new telehealth clinical pharmacy services between September 2014 to March 2015. Veterans were also sent surveys after their initial visit for satisfaction ratings.
 - **Practice:** Pharmacists at the West Palm Beach VA provided tele-mental health services to Veterans at the affiliated remote clinics, which don't have onsite mental health services.
 - **Outcomes:**
 - There was a 17% no-show rate for these visits, with 3 people not showing for a total of 7 visits.
 - These visits saved a total of 1432.6 miles of driving, or on average 34 miles per Veteran. Some of these Veterans are eligible for travel reimbursement, so the medical center would have paid \$674.50 to compensate those miles.
 - There was 100% overall satisfaction with the clinic and a majority would recommend it to other Veterans.
 - The success of this pilot led to primary care requesting SSRI follow-up via this modality, allowing for the mental health pharmacist to reach Veterans not in specialty mental health clinic.
 - **Conclusion:** Telehealth increased access to mental health care for Veterans, leading to decreased travel time, potential health system savings for travel reimbursement, and overall satisfaction with the service.
2. *Parikh M, Ebong EE, Harris E, et al. **Evaluation of clinical pharmacy services within the primary care mental health integration model at the Tuscaloosa Veterans Affairs Medical Center.** Mental Health Clinician. 2016;6(5):260-5.
- **Design:** Retrospective chart review was conducted on 2 groups of patients. The first group identified veterans enrolled in the Primary Care Mental Health Integration (PCMHI) clinic prior to CPS addition, from April 1, 2012, to March 31, 2013. This group was primarily seen by the behavioral health provider and medication therapy was initiated by the PCP. The second group

consisted of patients enrolled in the PCMHI clinic upon fully implementing the Clinical Pharmacy Specialist, from August 1, 2013, to July 31, 2014. This group was seen by both the BHP and the CPS.

- **Practice:** Mental Health Clinical Pharmacy Specialist in PCMHI.
- **Outcomes:**
 - 60% increase in the number of patients who achieved therapeutic goal
 - 32% decrease in the number of patients discharged to specialty MH clinic post-incorporation of CPS into PCMHI as compared to pre-incorporation of CPS ($P = 0.024$)

3. Parks KM, Donnelly F, Smithies J. **Initiative to improve the cardiogenic safety of antipsychotic medication in community mental health patients.** BMJ Open Qual. 2017;6(2):e000223.

- **Design:** Quality improvement project to increase the monitoring for patients on antipsychotics over the course of one year
- **Practice:** Efforts focused on increasing awareness for need of monitoring, patient engagement with this process, identification of patients requiring monitoring, and access to EKG equipment
- **Outcomes:**
 - Compliance with annual monitoring doubled during this intervention, from 43% in June 2015 to peak of 83% in February 2016
 - Improvements were sustained and required monitoring was completed consistently in >70% of patients

4. *Pardo D, Miller L, Chiulli D. **Implementation of a pharmacy consult to reduce co-prescribing of opioids and benzodiazepines in a Veteran population.** Substance Abuse. 2017;38:2, 157-160. DOI: [10.1080/08897077.2017.1290011](https://doi.org/10.1080/08897077.2017.1290011)

- **Design:** Single-center retrospective chart review comparing over-dose related emergency room visits or hospitalizations before and 1.5 years after implementation of a requirement to complete a prior authorization consult for co-prescribing benzodiazepines and opioid.
- **Outcomes:**
 - 36.4% reduction in benzodiazepine and opioid co-prescribing after consult implementation.
 - 17.6% reduction in over-dose related hospitalizations or emergency room visits (17 vs. 14).
 - Opioid related events increased from 9 to 10 while benzodiazepine and combination related event decreased from 2 to 1 and 6 to 3, respectively.
 - 168 consults were adjudicated during the study period, of which 32 were disapproved. Thirty of the 32 disapproved consults included pharmacist provided recommendations for an alternate therapy, and providers implemented these recommendations in 19 cases (63.3%).
- **Conclusion:**
 - Overdose-related ER visits and hospital admissions decreased after implementation of the prior authorization consult.
 - Introduction of a prior authorizations consult is one way pharmacists can play a role in decreasing co-prescribing of benzodiazepines and opioids as they are able to provide evidence based recommendations for alternative options.

5. *Harms M, Haas M, Larew J, DeJongh B. **Impact of a mental health clinical pharmacist on a primary care mental health integration team.** *Mental Health Clinician*. 2017; 7(3): 101-105.
- **Design:** Retrospective chart review looked at 50 patients referred to Primary Care Mental Health Integration (PCMH) medication management from July 2014 to March 2015.
 - **Practice:** Clinical Pharmacy Specialist (Advanced Practice Provider with scope of practice) in Primary Care Mental Health Integration providing comprehensive medication management.
 - **Outcomes:**
 - The analysis included 50 patients, which resulted in a total of 156 contacts between July 2014 and March 2015.
 - The mean change in PHQ-9, GAD-7, and PCL-C scores at week 12 as compared to baseline was a decrease of 10 (95% confidence interval [CI], 6.2-13.8, P 0.001), 8 (95% CI, 3.1-12.9, P 0.006), and 14.5 (95% CI, -17.3-46.3, P 0.109) respectively.
 - A total of 336 treatment interventions were made, and the overall medication adherence rate was 82.9%.
6. *Gibu M, Clark J, Gold J. **Mental health pharmacists as interim prescribers.** *Mental Health Clinician*. 2017; 7(3):111-115.
- **Design:** This study was a retrospective, cohort study of patients unassigned to an outpatient mental health prescriber due to prescriber turnover, receiving care at VA ECHCS between October 1, 2015, and February 28, 2016. The primary outcome was the number of pharmacist interventions performed. Secondary outcomes characterize the interventions performed and describe the change in the mean monthly volume of patients presenting to psychiatric emergency services (PES).
 - **Practice:** Mental Health Clinical Pharmacy Specialists in general mental health VHA practice.
 - **Outcomes:**
 - In this veteran population, 152 interventions were performed in 81 unique patients.
 - The most common intervention was prescription renewals (80%). Interventions most commonly involved antidepressants (28%), antipsychotics (10%), and mood stabilizers (10%).
 - Before initiation of the clinic, Denver VA PES experienced a mean of 300 monthly visits. After clinic implementation, PES visits decreased significantly to a mean of 237 visits per month ($P = .041$).
 - The pharmacist interim prescriber clinic was associated with a significant decrease in mean number of patients seen per month in PES.
7. *Herbert C, Winkler H, Moore T. **Outcomes of mental health pharmacist-managed electronic consults at a Veterans Affairs health care system.** *Mental Health Clinician*. 2017; 7 (3): 131-136.
- **Design:** This quality improvement project assessed the effectiveness of the e-consult service. Information was collected through a retrospective chart review of STVHCS veterans with the corresponding consult note placed in their chart from May 2014 through December 2015. Numbers of recommendations implemented and veterans maintained in primary care were analyzed as markers of effectiveness. Time and cost savings were secondarily explored.
 - **Practice:** Consults to Mental Health Clinical Pharmacy Specialists (advanced practice providers with a scope of practice) for management of veterans with lower acuity mental health conditions within primary care, making specialty mental health providers more available for those who need such services.
 - **Outcomes:**
 - A total of 361 consults were submitted for 353 unique patients.

- Of the 322 patients included in analyses, a total of 301 unique patients (93.5%) were maintained in primary care for at least 3 months.
 - Of the 21 not maintained in primary care, 15 recommendations were implemented; of those maintained in primary care, 271 recommendations were implemented.
8. *Dimitropoulos E, Bertucci S, Wong K. **Integration of a clinical pharmacy specialist into a substance use disorder intensive outpatient treatment program to improve prescribing rates of alcohol use disorder Pharmacotherapy.** Substance Abuse. 2018; 39:2:190-192.
- **Design:** This study was a prospective, longitudinal evaluation of a pharmacist's role in a substance use disorder (SUD) clinic, specifically an intensive outpatient program (IOP). The primary objective was to determine if the addition of a clinical pharmacy specialist (CPS) as a bridge until next available provider appointment would improve access to alcohol use disorder (AUD) pharmacotherapy for patients in the IOP.
 - **Practice:** Mental Health Clinical Pharmacy Specialists in the IOP managed AUD pharmacotherapy to increase access.
 - **Outcomes:**
 - A total of 43 patients were enrolled in the IOP during the study. Of these, 27 patients presented with a primary diagnosis of AUD, and only eight were receiving AUD pharmacotherapy at the start of the program. During this intervention, 11 patients expressed interest in initiating a medication for AUD while in the IOP.
 - The average wait time for a medication evaluation appointment with the CPS was 1.4 days. By comparison, the average wait time for an addiction psychiatrist was approximately 44 days. Each patient was seen for an average of two 30-minute visits, including an initial medication evaluation and one follow-up.
 - Upon completion of CPS services, patients were referred almost equally to an established non-addiction recovery services (ARS) mental health provider (36%), an ARS psychiatrist (36%), or a primary care provider (28%).
 - The study highlights the role that pharmacists can play in improving access to evidence-based AUD pharmacotherapy, as well as in providing medication education to patients and providers.
9. Bingham J, Axon DR, Scovis N, Taylor AM. **Evaluating the Effectiveness of Clinical Pharmacy Consultations on Nutrition, Physical Activity, and Sleep in Improving Patient-Reported Psychiatric Outcomes for Individuals with Mental Illnesses.** Pharmacy (Basel). 2018;7(1)
- **Design:** Pilot program for a pharmacist-delivered program designed to optimize mental health management by focusing on nutritional intake, physical activity, and sleep quality/quantity. The start of the initial telephone consultation involved reconciling the patient's medication list, reviewing allergies, assessing adherence to medications, and assessing nutritional intake, physical activity, and sleep qualities. The pharmacist would then provide counseling on ways to improve diet (target specific proteins that are essential neurotransmitter precursors), sleep, and physical activity. The pharmacist would then follow-up from this original intake two weeks later and assess/counsel further on these goals. Duke Health Profile (Duke) physical, anxiety, depression, and anxiety-depression scores were measured at the initial and follow-up visit.
 - **Outcomes:**
 - 34 patients participated in the program and completed both initial and 2-week follow-up consultations

- Statistically significant improvement in both the physical, and mental health Duke measures – physical ($p = 0.007$), anxiety ($p < 0.025$), depression ($p < 0.001$), and anxiety-depression ($p < 0.005$)
 - Larger changes in females than males for depression and anxiety-depression scores, and a larger change in whites than non-whites in the anxiety score.
 - **Conclusion:** This pilot study shows that a pharmacist-run consultation service focusing on improving mental health by targeting diet, sleep, and exercise is beneficial as seen by an improvement in Duke's mental and physical health scores.
10. *Pauly JB, Moore TA, Shishko I. **Integrating a mental health clinical pharmacy specialist into the Homeless Patient Aligned Care Teams.** Ment Health Clin. 2018;8(4):169-174.
- **Design:** A PGY-2 resident pharmacist in mental health was placed on a homeless patient aligned care team (H-PACT) to improve quality of care and outcomes were measured after 6 months of clinic involvement.
 - **Outcomes:**
 - 40 patient encounters were logged in clinic during this timeframe. Estimated cost savings from these interventions totaled \$33,613.
 - Veterans within H-PACT previously seen by the psychiatrist had an average wait time of 8 weeks. With the pharmacy resident, Veterans were seen every 4-6 weeks.
11. *Stefan TC, Elharar N, Garcia G. **Implementation and evaluation of Parkinson disease management in an outpatient clinical pharmacist-run neurology telephone clinic.** Ment Health Clin. 2018;8(3):159-162.
- **Design:** The West Palm Beach VA integrated a CPS into the neurology clinic to help manage medications for patients with Parkinson disease (PD) via telephone appointments. This prospective quality improvement project looked at patients with PD and a mental health diagnosis receiving psychotropic medications and calculated the number of interventions completed during this time frame. The CPS also conducted medication education groups.
 - **Outcomes:** Over 3 months, there were 16 encounters for 10 patients logged, resulting in 20 pharmacologic interventions and 29 non-pharmacologic interventions.
 - 25% of visits involved coordination of care
 - All participants of the medication education group (24 patients) found it beneficial and would recommend it to another Veteran
12. *Herbert C, Winkler H. **Impact of a clinical pharmacist-managed clinic in primary care mental health integration at a Veterans Affairs health system.** Mental Health Clinician. 2018;8(3):111-115.
- **Design:** This project evaluated the impact of a primary care mental health integration (PCMHI) clinical pharmacy specialist (CPS) clinic on managing patients with recent antidepressant initiation and CPS clinic intake from September 2015 through December 2016, including follow-up through January 2017. Markers used to evaluate effectiveness of the service included the Patient Health Questionnaire-9 scores, antidepressant medication possession ratio, number of emergency department visits for MH-related concerns, patient engagement in concurrent psychotherapy, and referrals to specialty MH providers.

- **Practice:** Mental Health Clinical Pharmacy Specialists (advanced practice providers with a scope of practice) manage veterans with uncomplicated mental health conditions in primary care, making specialty mental health providers more available for those who need such services.
- **Outcomes:**
 - A total of 196 unique patients had intake with the PCMH CPS in the time specified; 172 of these patients were included in analyses.
 - There were 155 patients maintained in PC.
 - Average Patient Health Questionnaire-9 scores decreased from 14.5 to 8.5, with 63 patients (46%) achieving response and 42 patients (31%) achieving remission. The average antidepressant medication possession ratio was 0.93 for all included patients.

13. Puzantian T, Gasper JJ. Provision of Naloxone Without a Prescription by California Pharmacists 2 Years After Legislation Implementation. JAMA. 2018;320(18):1933-1934.

- **Design:** This study investigated pharmacist prescribing habits 2 years after California's implementation of legislation allowing pharmacists to dispense naloxone without a prescription. A trained secret shopper went into pharmacies to request information about availability of naloxone.
- **Outcomes:**
 - Naloxone was available at 23.5% of the 1147 pharmacies that were surveyed.
 - More chain pharmacies (31.6%) offered naloxone than independent pharmacies (7.5%; $P < 0.001$).
 - Most (83.6%) pharmacies offered nasal formulation of naloxone, however only 50.6% of pharmacies had it in stock at the time of questioning.

14. Butala N, Michell M, Williams A, Kneebusch J. CPNP 2019 Annual Meeting Poster Abstracts: Implementation of a Pharmacist-Driven Tardive Dyskinesia Screening. Mental Health Clinician. 2019;9(3):141-257.

- **Design:** Riverside University Health System (RUHS) developed a pharmacist-driven screening tool to identify patients at higher risk of developing TD. The pharmacist-driven TD Screening Tool was implemented from August 20, 2018, to November 20, 2018. All patients admitted were screened daily by the clinical pharmacist. All patients who had 3 or more risk factors as determined by the TD Screening Tool were then screened for TD based on the validated AIMS tool.
- **Outcomes:**
 - There were 75 of the 390 patients (19%) who had 3 or more risk factors. 29 (39%) were too aggressive, disorganized, or refused participation, and 46 (61%) had an AIMS completed, of which 3 (7%) were positive.
 - Although no patients were prescribed a VMAT-2 inhibitor, additional pharmacist interventions were made for 15 patients (33%).
 - The TD Screening Tool was not effective in increasing treatment but allowed for an increased number of AIMS to be conducted, optimizing standard of care

15. Pals H, Ng S. CPNP 2019 Annual Meeting Poster Abstracts: Innovative Integration of Clinical Pharmacy Services in a Certified Community Behavioral Health Clinic. Mental Health Clinician. 2019;9(3):141-257.

- **Summary:** Descriptive report of pharmacist contributions to a CCBHC in rural Minnesota. One clinical pharmacist and one PGY-2 pharmacy resident are active in coordinating care with external



providers, providing targeted medication therapy management, consult services, pharmacogenomic testing, and patient education. Additionally, pharmacists contribute to high-quality care practices by presenting at grand rounds, developing evidence-based protocols and treatment algorithms, and conducting quality improvement projects.

- **Outcomes:**

- 48 outpatient and 30 assertive community treatment (ACT) patients were seen, resulting in 148 and 110 drug therapy problems (DTPs) identified, respectively.
- 70 (63.6%) of the ACT patients' DTPs related to medical conditions, demonstrating the vital role pharmacists play in integrating physical health care.

16. *Maryan S, Harms M, Mcallister E, Dejongh B. **Comparison of clozapine monitoring and adverse event management in a psychiatrist-only and a clinical pharmacist-psychiatrist collaborative clinic.** Ment Health Clin. 2019;9(2):70-75.

- **Design:** A clinical pharmacist began seeing half of the patients managed with clozapine to determine pharmacist impact and identify barriers to clozapine use.

- **Outcomes:**

- No difference was found between the pharmacist-run and usual care patient outcomes.
- There was a decrease in number of antipsychotics, psychotropics, clozapine dose, and total cholesterol in those managed by the pharmacist.
- The biggest barrier to clozapine use noted by providers was patient refusal of monitoring.

17. *Jensen A, Beam C, Douglass A, Brabson J, Colvard M, Bean J. **Description of a Pharmacist-led Clinical Video Telehealth Group Clinic for Opioid Overdose Prevention and Naloxone Education.** Mental Health Clinician. 2019;9(4):294-297.

- **Design:** Single-center, descriptive analysis of adult patients across 2 VAMCs and 4 CBOCs from July-December 2016 who participated in pharmacist-run naloxone education groups.

- **Practice:** Weekly pharmacist-run group for naloxone training including in-person or telehealth clinic visits. Veterans were referred by their opioid prescriber or identified by the clinic's CPS in addition to reaching out to Veterans identified as high risk using the Stratification Tool for Opioid Risk Mitigation (STORM) dashboard.

- **Outcomes:**

- During this timeframe of initiating the clinic, 1 pharmacist prescribed 21% of the entire health system's naloxone (of 82 naloxone prescribers total).
- Patients with concomitant opioid and benzodiazepine prescriptions were more likely to be receiving their naloxone prescription through this clinic, rather than with their primary prescriber.
- Substance use disorder patients were less likely to participate in this group clinic to obtain naloxone.

- **Conclusion:** Owing to targeted efforts using the STORM dashboard, this modality of care was most successful at targeting patients with concomitant opioid and benzodiazepine prescriptions. These group clinics offering both in person and telehealth options to participate are a successful and innovative way to provide overdose education and naloxone distribution.

18. Coe AB, Bostwick JR, Choe HM, Thompson AN. **Provider perceptions of pharmacists providing mental health medication support in patient-centered medical homes.** J Am Pharm Assoc (2003). 2019;59(4):555-559.

- **Design:** Likert-style survey requesting primary care providers' perceptions on various aspects of mental health care in their academic medical center, including thoughts on pharmacist-provided mental health medication management
- **Outcomes:**
 - 85 respondents replied with an average of 11 years in practice
 - Most providers indicated 26-50% of their patients had a mental illness, but they estimated they only referred <10% of them to mental health
 - Majority felt access to psychiatric services were not acceptably timely
 - Many felt confident prescribing antidepressants, but very few felt confident prescribing antipsychotics or mood stabilizers
 - Participants agreed it would be helpful to have a clinical pharmacist in clinic to increase comfort level with prescribing
 - Barriers identified include lack of knowledge/training, low comfort in diagnosing severe psychiatric conditions, and access to psychiatry services

19. *Brunet N, Moore DT, Lendvai wischik D, Mattocks KM, Rosen MI. **Increasing buprenorphine access for veterans with opioid use disorder in rural clinics using telemedicine.** Subst Abus. 2020; e-pub ahead of print:1-8.

- **Design:** Quality improvement project to increase availability of medication for opioid use disorder (MOUD) to Veterans, focusing on tele-prescribing buprenorphine to rural sites.
- **Practices:** A psychiatric clinical pharmacist served as an internal facilitator by visiting with rural outpatient clinics' frontline staff/managers, providing MOUD education, supporting psychiatry providers, and briefing hospital leadership.
- **Outcomes:**
 - 12 Veterans were transferred to the rural telehealth buprenorphine clinic (home inductions: 2; monitored induction at CBOC: 4; transferred from another facility once tele-buprenorphine was made available: 6)
 - 9 of 12 remained on buprenorphine for a six-month time period after beginning buprenorphine telehealth services
- **Results:**
 - **Barriers identified:** concerns about legality of tele-prescribing controlled substances, conflicting interests of stake holders, and coordination with an existing buprenorphine program that required more attendance and abstinence than the tele-prescribing program.
 - **Facilitative factors:** collective sense of mission to combat the opioid epidemic, pre-existing use and comfort with telemedicine in other contexts, and the rural prescriber's control over Veterans referred to tele-prescribers

20. *Karst A, Colvard M, Bean J, Patel E, Pate R, Lister J. **Impact of a mental health trainee interdisciplinary program on a veteran population.** Journal of the American College of Clinical Pharmacy. Accepted 22 January 2020; publication pending.
- **Design:** Six-year review following the implementation of a trainee-led interdisciplinary outpatient mental health team at a Veterans Affairs (VA) hospital, evaluating changes in measurement-based care (MBC).
 - **Practices:** Longitudinal observation of changes in mental health symptom measurements in a team composed of a PGY-2 Psychiatric Pharmacy Resident, Clinical Postdoctoral Psychology Fellow, and a PGY-2 Psychiatry Resident.
 - **Outcomes:**
 - Statistically significant improvements seen in PHQ-9 (-6.00; $p < 0.001$), GAD-7 (-4.35; $p < 0.001$), and PCL-5 (-19.3; $p < 0.001$)
 - Numerical reduction in mental health-related emergency department visits, psychiatric hospitalizations, and psychiatric hospital days
 - Results support further study and incorporation of interdisciplinary care model in outpatient mental health
21. *Barrett M, Ward S, Colvard M. **Pharmacist-led telemental health transitions of care clinic improves antidepressant medication continuity posthospitalization.** Mental Health Clinician. 2020;10(6):381-384.
- **Design:** A pharmacist-led telemental health transitions of care clinic was created at a Veterans Affairs Medical Center to improve continuity of psychiatric medication therapy following discharge from an acute psychiatric hospitalization. This was a single-center, multi-site, retrospective cohort study (historical cohort). Patients were referred to the pharmacist-led telemental health transitions of care (TOC) clinic after screening by the inpatient psychiatric pharmacist responsible for discharge medication counseling. A psychiatric pharmacy resident conducted all clinic appointments under the supervision of a board-certified psychiatric pharmacist.
 - **Objectives:** The primary study objective was to determine the impact of a post-discharge pharmacist-led telemental health transitions of care clinic on improving antidepressant adherence rates after an acute psychiatric hospitalization. Secondary objectives included evaluation of rates of readmission to psychiatric hospitals, time to first mental health provider follow-up [including clinical pharmacy specialists, psychiatrists, and psychiatric nurse-practitioners], and characterization of various pharmacist interventions made during the clinic visit.
 - **Results:** Patients enrolled in the clinic were more likely to maintain a medication possession ratio >0.8 within 90 days of discharge when compared to a historical control (100% vs 43%, $P=0.035$). The clinic also improved time to first mental health provider follow-up as seen by a statistically significant improvement in the number of patients seen within 14 days of discharge by a mental health provider (100% vs 43%, $P=0.035$).
 - **Conclusion:** Pilot study results support that a pharmacist-led telemental health transitions of care clinic can improve antidepressant adherence after psychiatric hospital discharge and reduce time to post-discharge follow-up with a mental health provider. Results highlight the valuable role of psychiatric pharmacists in delivery of transitions of care services and support the expansion of current roles to improve outcomes after psychiatric hospitalizations.
22. Lee KC, Kim E, Kim J, et al. **Development of an innovative adult attention-deficit hyperactivity disorder clinic.** Mental Health Clinician. 2020;10(5):296-300.
- **Background:** Pharmacist-psychiatrist collaborative clinic models in specialty mental health clinics are limited, and there has been only 1 report of a clinic focused on adult attention-deficit

hyperactivity disorder (ADHD). This article describes the successful implementation of a pharmacist-psychiatrist collaborative practice agreement in an adult ADHD clinic at an academic medical center.

- **Practice description:** Adult patients diagnosed with ADHD after a comprehensive assessment, including a full neuropsychological evaluation, were enrolled in the collaborative treatment clinic. During visits, the psychiatric pharmacist evaluated the patient's response to medication therapy, symptom improvement, side effects, and adherence. Pharmacist practice opportunities included psychiatric evaluation, medication management, medication counseling, and referral to auxiliary services.
- **Results:** 58 patients and 774 patient encounters at the collaborative pharmacist-psychiatrist practice were reviewed. 573 office visits were completed, half of which were coded as pertaining to problems with moderate to high severity and lasting a minimum of 25 minutes. Using Medicare payment rates, the expected payment for these visits would be \$85,993 over 3 years.
- **Conclusions:** Faculty and their respective departments felt that the partnership was successful. Clinics such as the one described in this article represent a significant opportunity for psychiatric pharmacists to meet the critical needs of patients with ADHD.

23. *Laguado SA, Steavenson R, Mehvar M. **Areas of improvement in suicide risk identification, assessment, and risk mitigation documentation by mental health prescribers at a veterans affairs health care system.** Adm Policy Ment Health. Published online January 5, 2021.

- **Purpose:** Veterans have a suicide rate 1.5 times higher than the non-veteran population. The Department of Veterans Affairs (VA) implemented suicide risk screening recommendations in 2018. This project assessed the impact of mental health (MH) prescribers on these recommendations and identified areas of improvement.
- **Methods:** Seventy MH Clinical Pharmacy Specialists (CPS) and 52 other MH prescribers were included. Patients with a positive question nine (from the Patient Health Questionnaire-9) and a same-day Columbia Suicide Severity Rating Scale (C-SSRS) between 11/01/18 and 11/01/19 at a VA system were reviewed. Completion of same-day Comprehensive Suicide Risk Evaluation (CSRE), same-day Suicide Prevention Safety Plan (SPSP), number of patients who were not offered naloxone despite access to opioids, and number of patients who were not offered a gunlock despite access to firearms were compared between groups. Time from C-SSRS to suicidal behavior was compared between those who did and did not receive a same-day CSRE.
- **Results:** MH CPS were significantly more likely to complete a same-day CSRE ($p = 0.0201$) and SPSP ($p < 0.001$) when recommended. Naloxone outcomes were not assessed due to availability of only one data point. Rates of gunlock offers did not differ significantly between groups (Fisher's exact test, $p = 0.3189$) however there was no documentation stating why they were not offered when appropriate 40% of the time. Time to suicidal behavior did not vary across patients based on CSRE completion ($p = 0.16$).
- **Conclusion:** MH CPS play an important role in suicide risk screening for veterans. There is a need for improvement regarding the offering and documentation of firearm risk mitigation strategies.

24. *DeRonne BM, Wong KR, Schultz E, Jones E, Krebs EE. **Implementation of a pharmacist care manager model to expand availability of medications for opioid use disorder.** American Journal of Health-System Pharmacy. 2021;78(4):354-359.

- **Overview:** This article provides an overview of a clinical pharmacist care manager (CPCM) model for medications for OUD (MOUD) treatment implemented within the Minneapolis Veterans Affairs Health Care System.



U.S. Department of Veterans Affairs

Veterans Health Administration

PBM Clinical Pharmacy Practice Office

- **Description of practice:** A Clinical Pharmacy Specialist (CPS) was appointed to lead an interdisciplinary committee including prescribers, nurses, psychologists, and other pharmacists practicing in primary care, pain management, and mental health to guide program development. Pharmacists were integral in program development and implementation and served as the main care providers. Four primary care pharmacists and three pharmacists with expertise in mental health expanded their practice to include MOUD management. This model allowed care for patients already established on MOUD therapy to be transitioned to a CPCM for ongoing management or interim coverage; it also allowed for facilitation of MOUD initiation. X-waivered prescribers were present at patient's initial visit and continued to see patients at least annually. Pain care modalities offered by the CPCM model included MOUD adjustments, non-opioid pain medication interventions, non-pharmacologic strategies, and referrals to other services.
- **Results:** An interim evaluation of the program established that the proportion of patients with OUD receiving MOUD had increased (33.8% to 46.7%), with use of the program resulting in treatment of 109 unique patients during 625 visits. 47 of these patients were initiated on MOUD via direct facilitation by a CPCM. Results showed that this model also reduced workload for in-demand prescribers.
- **Discussion/conclusion:** The CPCM model of provision of MOUD expanded the pharmacist role in buprenorphine management. The need to increase the number of patients receiving MOUD led to the implementation of a CPCM model. The program was effectively implemented into practice and expanded the availability of MOUD, which allowed patients to access treatment in multiple care settings.

25. *Mailloux LM, Haas MT, Larew JM, DeJongh BM. **Development and implementation of a physician-pharmacist collaborative practice model for provision and management of buprenorphine/naloxone.** *Mental Health Clinician*. 2021;11(1):35-39.

- **Introduction:** Physician-pharmacist collaborative practice models (PPCPM) decrease barriers and increase access to medications for opioid use disorder (MOUD) but are not routine in practice. The purpose of the quality improvement initiative described here is to develop and implement a PPCPM for management of patients on MOUD with buprenorphine/naloxone in order to minimize provider burden, expand access to treatment, and enhance overall patient care.
- **Methods:** A PPCPM for management of patients on MOUD with buprenorphine/naloxone was piloted in an outpatient substance use disorder clinic. Approximately 4 hours per week were dedicated to physician-pharmacist collaborative medical appointments for a 5-month trial period. The pharmacist met with the patient first and then staffed the case with the collaborating psychiatrist. Descriptive data from PPCPM appointments was collected and compared to data from psychiatrist-only appointments.
- **Results:** 25 patients were seen over 44 appointments with an estimated 33 hours of psychiatrist time saved. Average initial and end buprenorphine doses, urine drug screen (UDS) results, and mental health (MH) medication interventions were similar between patients seen in PPCPM appointments compared with those seen in psychiatrist-only appointments. Collection of UDS, identification and management of MOUD adherence issues, referrals to other services, and medication reconciliation interventions were more frequent in PPCPM appointments.
- **Discussion:** Implementation of a PPCPM allowed for provision of a similar level of care regarding MOUD and MH-related medication management while saving psychiatrist time.

1980-2000

1. Inoue F. **A clinical pharmacy service to reduce psychotropic medication use in an institution for mentally handicapped persons.** *Ment Retard* 1982;20:70–4.
 - **Design:** Retrospective chart review with historic control (before-after design) of 680 patients with behavioral disturbances in an institution for mentally handicapped persons over a five-year period.
 - **Practices:** Pharmacists performed drug management review (drug monitoring, treatment recommendations), and were permitted to order laboratory tests under protocol.
 - **Outcomes:**
 - 45% decrease in number of psychotropic drugs prescribed
 - 50% of patients with improved cognitive function after treatment changes
 - 8% of patients with symptom worsening after treatment changes
2. Stimmel GL, McGhan WF, Wincor MZ, et al. **Comparison of pharmacist and physician prescribing for psychiatric inpatients.** *Am J Hosp Pharm* 1982;39:1483–6.
 - **Design:** Retrospective cohort study of 158 prescriptions for hospitalized psychiatric patients with various disorders in a small inpatient HMO psychiatric facility. Expert clinical judges graded pharmacist/physician prescribing practices based on prescribing quality guidelines by the American Psychological Association. 38 prescriptions were completed by the pharmacist, 120 were completed by physicians as standard practice.
 - **Practices:** Pharmacists were allowed to prescribe under protocol with the supervision of a physician (certified as prescribers).
 - **Outcomes:** Pharmacist prescribing was comparable to physician prescribing for anticholinergics, but significantly better for antipsychotics and antidepressants.
3. Morton WA, Mendenhall AR, Windsor PG, Lydiard B. **Clinical psychopharmacy consultations: acceptance of recommendations on an adult inpatient psychiatric unit.** *Hosp Pharm.* 1995;30(9):786–90.
 - **Design:** Retrospective evaluation of 135 pharmacist interventions in an adult psychiatric hospital following referral by a physician.
 - **Practices:** A pharmacist recommended clinical interventions.
 - **Outcomes:** 79% of pharmacist recommendations were implemented.
4. Dorevitch A, Perl E. **The impact of clinical pharmacy intervention in a psychiatric inpatient hospital.** *J Clin Pharm Ther.* 1996;21:45–8.
 - **Design:** Prospective evaluation of 109 physician-initiated consultations with a clinical pharmacist over a one-year period.
 - **Practices:** Clinical pharmacists provided recommendations regarding drug therapy changes, dosing schedule changes, preventative measures, medication side effects, and laboratory tests or monitoring parameters.
 - **Outcomes:**
 - 67.9% of patients exhibited a very satisfactory or satisfactory response to clinical pharmacist recommendations.

2001-Present

1. Shaw H, Mackie CA, Sharkie I. **Evaluation of effect of pharmacy discharge planning on medication problems experienced by discharged acute admission mental health patients.** *Int J Pharm Pract.* 2000;8(2):144–53.
 - **Design:** Randomized controlled trial of 51 acute care psychiatric patients (46 control) at a large psychiatric hospital over a 12-week period post-discharge.
 - **Practices:** Pharmacists educated patients about their medications, developed discharge summaries for use by community pharmacist, and conducted follow up visits.
 - **Outcomes:**
 - Drug knowledge improved and maintained at 12 weeks
 - Increased compliance and fewer medication problems at 12 weeks
2. Canales PL, Dorson PG, Crismon ML. **Outcomes assessment of clinical pharmacy services in a psychiatric inpatient setting.** *Am J Health Syst Pharm.* 2001;58(14):1309–16.
 - **Design:** Prospective cohort study of acute psychiatric inpatients in a state psychiatric facility over a six-month period. 45 patients were in the active group and 48 patients were in the control group.
 - **Practices:** Pharmacists were responsible for attending treatment team meetings, performing baseline assessments and weekly reviews, monitoring for adverse reactions, making pharmacological treatment recommendations, providing patient/provider education, and completing discharge counseling.
 - **Outcomes:**
 - Improved clinical outcomes
 - Decreased rates of drug-induced adverse effects
3. Virani A, Crown N. **The impact of a clinical pharmacist on patient and economic outcomes in a child and adolescent mental health unit.** *Can J Hosp Pharm.* 2003;56(3):158–62.
 - **Design:** Prospective evaluation and retrospective cost analysis of 48 pharmacist interventions in a pediatric mental health setting.
 - **Practices:** Pharmacists conducted (or recommended?) clinical interventions.
 - **Outcomes:**
 - 98% of pharmacist recommendations were implemented.
 - 86% of interventions were assessed as having a positive effect on patient care.
 - 14% decrease in drug cost per patient-day
 - 21% decrease in total drug costs
4. McKee J, Cleary S. **High-risk, high-alert medication management practices in a regional state psychiatric facility.** *Hosp Pharm.* 2007;42(4):323–30.
 - **Design:** Historical control study of 551 patients taking lithium, clozapine, or warfarin in a state psychiatric facility over a 21-month period.
 - **Practices:** Pharmacists performed enhanced clinical monitoring of laboratory results for high-risk patients taking lithium, clozapine, or warfarin.
 - **Outcomes:**
 - Adverse drug reactions decreased from 6% to 3% for lithium, from 2% to 1% for clozapine, and increased from 0 to 0.5% for warfarin.

5. *Lacey J. Miller and Rachel E. Grande (2015) **Clozapine-induced myocarditis may warrant cardiac monitoring protocol.** Mental Health Clinician: March 2015, Vol. 5, No. 2, pp. 82-87. [Clozapine-induced myocarditis may warrant cardiac monitoring protocol](#)

- **Summary:**

- Case report from VA Palo Alto Health Care system of a 24-year-old Filipino male with schizoaffective disorder, bipolar type, who was started on clozapine during a 5150 admission. Clozapine dose was titrated up to 125 mg over 17 days.
- On day 14 of clozapine treatment, the patient complained of chills, a nonproductive cough, sore throat, headache, and fatigue with no chest pain. Patient was febrile and tachycardic. Cardiology service consulted, and workup revealed elevated troponin-1, creatinine phosphokinase, and C-reactive protein. B-type natriuretic peptide was within normal limits, with a high normal erythrocyte sedimentation rate. Cardiology diagnosed patient with clozapine-induced myocarditis, and clozapine was discontinued on day 17.
- Three days after clozapine discontinuation, all laboratory values returned to normal limits and myocarditis was determined to likely be related to clozapine after calculating the Naranjo scale.
- Cardiology service discussed that clozapine retriial could be possible if this patient decompensates in the future, but would require careful monitoring and coordination with the cardiology service.

- **Outcomes:**

- Two changes were made to clozapine monitoring at VA Palo Alto after this case: 1) monitoring of troponin-1, CRP, and CPK within 7 days of clozapine initiation and 2) these labs are then checked weekly for the first month. Additionally, a nursing assessment note was created for daily assessment of clozapine related side effects and to have increased clinical oversight for clozapine new starts.

6. *Koch J, Ward S, Thomas C. **Implementation and results of a symptom-triggered opioid withdrawal protocol at a Veterans Affairs medical center.** Ment Health Clin [Internet]. 2017;7(6):282-6. DOI: 10.9740/mhc.2017.11.282. PMCID: PMC6007729.

- **Design:** This is a 2-phase project. In phase 1, authors developed a symptom-triggered opioid withdrawal protocol using the Clinical Opiate Withdrawal Scale for assessment and buprenorphine/naloxone or clonidine for treatment. In phase 2, a retrospective cohort analysis was conducted comparing outcomes between group 1 (before protocol initiation) and group 2 (after protocol initiation with clonidine), and group 3 (after protocol initiation with buprenorphine/naloxone.)

- **Outcomes:**

- Primary outcome: duration in days of administration of buprenorphine/naloxone or clonidine for detoxification was found to be statistically significant in favor of the protocol (clonidine: $P=0.0064$, -1.17 days; buprenorphine/naloxone: $P=0.0267$, -1.05 days).
- Secondary outcome: sobriety 3 months after index admission in patients who were maintained on buprenorphine/naloxone was found to be statistically significant ($P=0.0096$).
- No statistically significant difference:
 - The before protocol and after protocol groups did not differ significantly in the total duration of hospitalization in days. Mean hospitalization duration before

- protocol initiation was 4.64 days compared with 5.66 days ($P=0.3137$) after protocol initiation in individuals who received buprenorphine/naloxone.
- Substance abuse treatment program (SATP) participation before and after protocol adoption did not differ significantly (clonidine group: $P = 0.6609$; buprenorphine group: $P = 0.0537$), nor did sobriety at 3 months after index admission (clonidine group: $P = 0.0978$; buprenorphine group: $P = 0.1744$).
 - The detoxification durations for groups 2 and 3 were compared, and there was no statistically significant difference ($P = 0.6382$).
 - For further evaluation of the differences in SATP participation and 3-month opioid sobriety rates before and after protocol implementation, the clonidine and buprenorphine/naloxone groups were combined. There was no statistically significant difference detected for either SATP participation ($P = 0.1791$) or 3-month opioid sobriety rates ($P = 0.0627$).
- **Conclusion:** Implementation of a symptom-triggered opioid withdrawal protocol decreased the duration in days that buprenorphine/naloxone or clonidine was administered for detoxification purposes.